



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,243	09/25/2006	Christian Walsdorff	296729US0PCT	2192

22850 7590 04/05/2010
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
----------	--------------

1793

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

04/05/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/594,243	Applicant(s) WALSDORFF ET AL.	
	Examiner Ngoc-Yen M. Nguyen	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-26 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-17, 19-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This application contains claim 8 drawn to an invention nonelected with traverse in the reply filed on May 6, 2009. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-17, 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibi et al (2002/0172640) in view of Iaccino et al (2008/0047872) and Shirk (3,482,946).

Hibi '640 discloses a process of producing chlorine by oxidizing hydrogen chloride with oxygen using a supported ruthenium oxide catalyst (note claim 1). The support can be titanium oxide, alumina, zirconium oxide, etc. (note claim 4). This process is well known in the art as a Deacon process and the reaction is well known to be an exothermic reaction.

Hibi '640 further teaches that the catalyst can be used in a reactor such as fixed bed reactor, fluidized bed reactor, etc. with the fluidized bed has an advantage that the

Art Unit: 1793

temperature distribution width in the reactor can be reduced because heat in the reactor can be sufficiently removed (note paragraph [0067]-[0068]).

The difference is Hibi '640 does not disclose that the temperature within the fluidized bed decreases from an absolute temperature maximum along the flow direction to the surface of the fluidized bed.

Iaccino '872 teaches that for an exothermic reaction, it may be carried in multiple catalyst beds with heat removal between beds. In addition, the lead bed(s) may be operated at higher temperatures to maximize kinetic rates and the tail bed(s) may be operated at lower temperatures to maximize thermodynamic conversion (note paragraph [0098]).

It would have been obvious to one of ordinary skill in the art to optimize the temperature difference between the lead bed and the tail bed to maximize both the kinetic rate and the thermodynamic conversion for the process of Hibi '640.

Shirk '946 is applied to teach a reactor for effecting contact between vaporous reactants and fluidized (note claim 1) finely divided solids in which an upright, elongate reaction zone is compartmented. Means are provided to introduce gasiform fluids into the lower end of the reactor and to remove gasiform fluid, free of solids, from the upper end of the reactor. Temperature control means is provided within each compartment to that the mixture of vapors and fluidized solids moving freely within and between compartments may have independent temperature adjustment within each compartment (note abstract). Shirk '946 further teaches that the reactor design provides an excellent

Art Unit: 1793

means of maintaining the desired operating temperature within about 3°F, assuring the removal of the exothermic heat of reaction (note column 4, lines 47-51).

As shown in Figure 1 of Shirk '946, the bed can be divided into multiple zones. The bottom perforated tray as shown in Figure 1 is considered as the claimed "gas distributor". It would have been obvious to one of ordinary skill in the art to optimize the process conditions in Shirk '946, such as superficial gas velocity, the shape of the opening for the perforated plate, etc. in order to obtain the desired temperature in the fluidized bed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry the exothermic reaction of producing chlorine as disclosed in Hibi '640 with higher temperature at the beginning of the reaction (i.e. lead bed) and lower temperature at the end (tail bed), as suggested by Iaccino '872 in order to maximize both the kinetic rate and the thermodynamic conversion and to use a single fluidized bed reactor as suggested by Shirk '946 because this reactor is compartmented and each compartment can serve as a "bed" as suggested in Iaccino '872 and the temperature in each compartment can be controlled independently to obtain the higher and lower temperatures as desired by Iaccino '872.

Claims 10-17, 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibi '640 in view of Degnan et al (5,573,657) and Shirk '946.

Hibi '640 is applied as stated above.

Art Unit: 1793

Degnan '657 is applied to teach that for an exothermic process, it is thermodynamically favored by lower temperatures but for kinetic reasons, moderately elevated temperatures (i.e. higher temperatures) are normally used (note column 1, lines 32-35).

Thus, it would have been obvious to one of ordinary skill in the art to maximize both the kinetic rate and the thermodynamic conversion for the process of Hibi '640 by operating the fluidized bed at two different temperatures, i.e. at a higher temperature for kinetic reasons, and lower temperature for thermodynamic reasons, as suggested by Degnan '657.

Shirk '946 is applied as stated above to teach that a fluidized bed can have multiple compartments and the temperatures in these compartments can be independently controlled.

Applicant's arguments filed December 2, 2002 have been fully considered but they are not persuasive.

The rejection over Clarke '706 is withdrawn in view of Applicants' argument.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

Art Unit: 1793

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicants argue that Shirk discloses that his reactor design provides an excellent means of maintaining the desired operating temperature within about 3 to at most 5 Fahrenheit degrees, or well below the presently-recited minimum of 10 Kelvin degrees.

In Shirk, the step of maintaining the desired operating temperature within about 3 Fahrenheit degrees is for a isothermal process (note column 4, lines 47-52); however, as suggested by Iaccino, to maximize both the kinetic rates and thermodynamic conversion for an exothermic reaction, the temperature is desired to be high at first and lower afterward. Thus, it would have been obvious to one skilled in the art to optimize the independently adjust the temperature in the compartments to obtain the desired temperatures as suggested by Iaccino for the process of Hibi.

Applicants argue that Degnan does not disclose that an exothermic chemical reaction can be carried out in a fluidized bed, wherein there is a temperature distribution along the flow direction in the fluidized bed.

Regardless of what apparatus is used to carry out the exothermic reaction in Degnan, Degnan still discloses that such reaction is favored thermodynamically by lower temperatures but for kinetic reasons, moderately elevated temperatures are used. Thus, it would have been obvious to one skilled in the art to optimize the temperature profile for an exothermic reaction, such as the reaction disclosed in Hibi, in order to maximize both the kinetic rates and the thermodynamic conversion.

Applicants argue that at best, one skilled in the art would employ two separate reactors wherein a first reactor is operated at a first temperature and the second reactor at a second temperature.

As suggested by Degnan, the goal is to maximize both the kinetic rates by using high temperature and the thermodynamic conversion by using low temperature, since Shirk clearly teaches that the temperature in each compartment can be independently adjusted, it would have been obvious to one skilled in the art to use the reactor with multiple compartments as suggested by Shirk because such reactor is more compact (thereby costs less) than using multiple reactors.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

nmn
April 5, 2010

Application/Control Number: 10/594,243
Art Unit: 1793

Page 9